COMPUTATION OF FINANCIAL INCLUSION INDEX: A COMPARATIVE STUDY ON DISTRICTS OF ASSAM

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Introduction

The term financial inclusion is one of the emerging topics of discussionglobally in the present era. Financial inclusionrefers to universal access of financial products and services at an affordable cost to all income groups without any barrier (Planning Commission of India, 2009). Inclusion of people into the formal financial system helps ineliminating poverty, boosting savings and investment habit and thereafter prevents social exclusion (Camara & Tuesta, 2014). In rural areas availability of well develop financial resources helps in eliminatinglong run poverty by enhancing access to education, self -employment, human development and the economic growth. Increasing access to this financial products and services creates efficient allocation of resourcesby providing better leverage to the weaker and underprivileged sections. An inclusive financial system is considered as an instrument in achieving equitable economic growth and eradiating emerging issues of a nation (Julie, 2013 & Kamboj, 2014). Inadequate utilization of the available financial resources discourages economic growth by creating regional imbalances and inequalities among different sections (Julie, 2013). India one of the emerging nation has adopted ample of innovative ideas and policies in increasing the coverage of financial resources among its growing population. Monetary authorities along with the government have unceasingly espoused updated banking tools for easy availability since after the nationalization of commercial banks (Das & Choubey, 2015). In order to condense the dependence of the informal sector door step financial policies wereintroduced in the country in the recent years. In spiteof updated bankingpolicies and regular reformsproblem of exclusion still dominates the economy basically rural and unorganized sector (Gloukoviezoff, 2006). The basic reason behind such exclusion of population from formal institutions is theasymmetric information between the service providers and the unserved section (Sarma, 2008). Demand and supply sided plausible reason for exclusion in India are basically lack of financial awareness, illiteracy, poorer standard of living, distance from bank branch, cumbersome documentation, unsuitable

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banking products, inconvenient branch timing, language barrier and staff attitudes(CRISIL Inclusix, 2018).With a motive to remove the barriers of exclusion and encourage usages of formal financial resources National Rural Financial Inclusion Plan was launched in India as a part of financial inclusion program. RBIon 2005 directed all operating financial institutions to expedite basic "no fill accounts"with a minimum balance and on 2006 it invigorated all commercial banks and RRBs to setup bank linkage with self-help groups and micro-finance (Sarma 2008).CRISIL developed an index with a motive to accurately measure depth of inclusion across all districts of India by taking three basic indicators- branch penetration, deposit penetration and credit penetration and seven other sub-indicators. The index was framed on account of helping the policy makers in mapping the progress of financial inclusion and adopts remedial measures in the areas concern (Gupte, et. al., 2012).

Literature Review

Burgees & Pande (2005)studied the effect of rural bank branch branches in India since 1977-1990. The study observes that with the continuous expansion of bank branches poverty rate of the nation has significantly declined which furtherincreases non-agricultural output of the small and marginal farmers.Mahadeva (2009) observes the creation of necessary financial infrastructure at the panchayat level for the extension of financial citizenship and providinghealthier access to financial services for unserved section. Gupte R et.al (2012)computesan index to measure inclusion level by considering outreach, ease of transaction, usage and cost of transaction dimensions. Camara et. al. (2014) uses demand and supply-side variables to measure the depth of inclusion in their research.They postulated two stages Principal Component Analysis (PCA) by undertaking usage, access and barrier dimensions to study the inclusion level. According toDas & Choubey (2015), in Assam the demand side of financial services is dominant by semi-formal organization where the role of informal lenders has graduallystarted minimizing in the present decade. On the supply side there exists variation among rural and urban areaseven after continuous efforts of formal institutions.Konwar& Barua (2018), in their research highlights Tinsukia district as one of the high performer district of the Assam as per the availability of financial products services while Lakhimpur district comes under the section of medium inclusion according to Konch (2020).Reason behind higher exclusion and lower inclusion is mainly because of low level of saving, lowerincome, distance from bank, expensive financial products and lack of identity proof. A study conducted by Maity & Sahu (2022), from 2007-08 to 2018-19 on the northeastern states reveals that among all the seven states, bank branches have been growing at an increasing rate in Assam.

From the literatures it has been clear that although there are many studies on financial

inclusion in Assam but the studies were limitedto performance only ignoring actual depth of inclusion. Therefore this research attempts to examine depth of inclusion in Assam by computing Inclusive Financial Index by using the methodology adopted by UNDP for the computation of HDI, HPI, GDI and so on.Availability, usage and penetration dimensions are framed using different sub-indices.

Objective:

1. To examine the status of financial inclusionin the districts of Upper Assam
2. To find out the depth of inclusion in the study area.
3. To compute and compare financial inclusion index for the study area

Research Methodology:

Financial Inclusion Index (FII) in this research is being computed by using similar methodology adopted by UNDP for the computation of HDI, HPI, GDI and so on. Availability, usage and penetration dimensions are framed using different sub-indices. The indices framed is based on various data incorporated from Census of India, RBI Quarterly statistics, State Level Bankers Committee and Statistical Handbook of Assam.

Results & Discussion

1. Financial Inclusion Status:

Financial inclusion program in Assam has been regularly regulate and monitored by State Level Bankers Committee (SLBC).Table 1 below shows district wise banking status of the population of Upper Assam as on December 2023. From the table it is clear that in terms of population, Tinsukia district ranks highest and Charaideo the new created district ranks lowest. In terms of C-D ratio Dhemaji district ranks at the top position while Tinsukia and Dibrugarh district in spite of largest in terms of area and population has C-D ratio of only 54% and 47%.

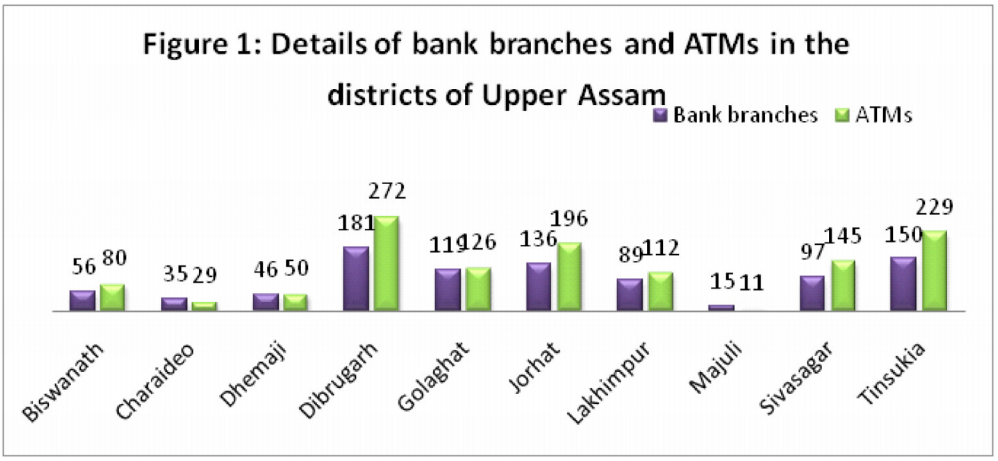
Table 1: District wise Distribution of Population & Bank Status of Upper Assam (as on Dec. 2023)

District	Population	Bank Branch	ATMs	DA(per lakh population)	CA (per lakh population)	PCD	PCC	C-D Ratio
Biswanath	612491	56	80	1788	1064	32145	17660	59
Charaideo	458615	35	29	1295	519	30453	10542	42
Dhemaji	686133	46	50	1675	1265	17498	17498	85
Dibrugarh	1326335	181	272	13286	5399	100420	39845	47
Golaghat	1066888	119	126	4466	2775	41749	23913	66

Jorhat	924952	136	196	8391	4532	88116	44885	60
Lakhimpur	1042137	89	112	3217	2528	31676	23402	84
Majuli	167304	15	11	326	208	29658	14661	65
Sivasagar	692435	97	145	5360	2974	75758	40816	63
Tinsukia	1327929	150	229	8273	4009	62899	30869	54

Source: State Level Bankers Committee

From figure 1 below it is clearly that among all the districts of Upper Assam Dibrugarh district ranks highest in terms of both bank branches and ATMs present. Majuli a newly created district of Assam consist of only 15 bank branches and 11 ATMs which visibly indicates lower availability of banking institutions compared to the other districts. Charaideo with 35 branches and 29 ATMs,Dhemaji 46 branches and 50 ATMs, Biswanth 56 branches and 80 ATMs indicate lower availability of banking services compared to Dibrugarh, Jorhat, Golaghat, LakimpurSivsagar and Tinsukia. Tinsukia district inspite of largest in terms of area consist of only 150 bank branches and 229 ATMs.



Source: State Level Bankers Committee

2. Measurement of Financial Inclusion Index (FII)

Researcher has used different measurement tools to measure Financial Inclusion Index(FII) over the years. FII used in the present study has been established by Sarma M. (2008) similar to the method used by UNDP for the computation of HDI, HPI, GDI so on.FII in this studyis computed in three stages: indicator, dimension and financial inclusion index. Indicator index for ith dimension is calculated by:

$$d_i = W_i \frac{A_i \quad m_i}{M_i \quad m_i} \text{---------- (i)}$$

W_i = weight attached to dimension i($0 \leq w_i \leq 1$)

A_i = actual value of dimension i

M_i = upper value of dimension i

m_i = lower limit of the value of dimension i.

If the value of d_i is higher, higher will be the district's achievements in dimension i. If n dimensions are considered then a district j will be:

$D_j = (d_1, d_2, d_3\ d_4 \ldots\ldots d_n)$ for n-dimensional Cartesian space

For n-dimensional space 0= (0,0,0,….0) represents point indicating lowest achievements in all the dimensions, and the point 1=(1,1,1,…..1)represent highest achievement for all dimension. For calculating values of each dimension of FII from the indicators the normalized inverse Euclidean distance of point D_i from the ideal point 1=(1,1,1….1) is used. Thus equation forFII is:

$$FII = 1 \quad \frac{\sqrt{(1 \quad d_1)^2 + (1 \quad d_2)^2 + \quad + (1 \quad d_n)^2}}{\sqrt{n}} \qquad \ldots\ldots \text{(ii)}$$

Normalization has been donein order to make the IFI value lie between 0 and 1. Higher the value of FIIrepresentshigher inclusion and vice versa (Sarma, 2008).

FII for this study has been calculated by considering penetration, availability and usage dimensions.

1. Availability (Ai):

Banking availability means extent of banking services available to its users. Under this dimension two indicators are used namely bank branches and ATMs per 1 lakh population.

2. Banking penetration (Pi):

This dimension consistof two indicators namely, deposit account and credit account per 1 lakh population

3. Usage (Ui):

Usage indicator indicates proper utilization of banking services by its users. It indicates three indicators: per capita credit, per capita deposit,and C-D ratio.

Thus, inclusive financial value is calculated by using following formula:

$$FII = 1 \quad \frac{\sqrt{(1 \quad p_i)^2 + (1 \quad a_i)^2 + (1 \quad u_i)^2}}{\sqrt{3}}$$

The three dimensional indices penetration, availability and usage are denoted byp_i, a_i *and* u_i.

The level of Financial Inclusion is categorized into five categories depending upon the IFI value (CRISIL Inclusix report):

(a) $0.8 \leq FII \leq 1$:Very High Level Financial Inclusion
(b) $0.6 \leq FII \leq 0.8$:High Level Financial Inclusion
(c) $0.4 \leq FII \leq 0.6$: Medium Level Financial Inclusion
(d) $0.2 \leq FII \leq 0.4$: Low Level Financial Inclusion
(e) $0 \leq FII \leq 0.2$: Very Low Level Financial Inclusion

Index for Availability Dimension (Da)

Index for availability dimension is calculated by taking into account two indicators: bank branches and ATMs per lakh population. Table 2 shows district wise index value and ranks for availability dimension.

Table 2: District wise Index for Availability Dimension

Districts	No. BB per 100000pop			No. ATMs per 100000pop			Availability Index	
	BB/Pop	Index	Rank	ATM/Pop	Index	Rank	A_i	Rank
Biswanath	9.14	0.230	6	13.06	0.165	5	0.197	6
Charaideo	7.63	0.181	9	6.32	0.067	10	0.124	9
Dhemaji	6.70	0.151	10	7.28	0.081	8	0.116	10
Dibrugarh	13.64	0.974	1	20.50	0.273	3	0.623	1
Golaghat	11.15	0.294	5	11.81	0.147	6	0.220	5
Jorhat	14.70	0.408	2	21.19	0.283	1	0.345	2
Lakhimpur	8.54	0.210	8	10.74	0.131	7	0.170	7
Majuli	8.96	0.224	7	6.57	0.071	9	0.149	8
Sivasagar	14.00	0.386	3	20.94	0.280	2	0.333	3
Tinsukia	11.29	0.299	4	17.24	0.226	4	0.262	4

Source: Author's own computation

Table 2 reveals that in terms of availability of financial services in Upper Assam Dibrugarh district ranks at the top position with an index value of 0.623, followed by Jorhat 0.345.Dhemaji ranks lowest as compared to all the districts with 0.116 as an index value. In terms of highest bank branches and ATMs per lakh population Dibrugarh and Jorhat ranks at the highestpositionswith an index value of 0.974 & 0.283. However, Dhemaji (0.151) and Biswanath (0.067) ranks lowest in both the indicators of availability index

Index for Penetration Dimension

Penetration index is calculated by taking two indicators: deposit account per 100000 populations and credit account per 100000 populations. Table 3 shows district wise penetration index and its rank values:

Table 3: District wise Index for Penetration Dimension

Districts	No. of Deposit Account per 100000 populations				No. of Credit Account per 100000 populations				Penetration Index (P_i)	
	DA	DA/ Pop	Index	Rank	CA	CA/ Pop	CI	Rank	P_i	Rank
Biswanath	1788	292	0.037	7	1064	174	0.055	8	0.212	1
Charaideo	1295	282	0.035	8	519	113	0.031	10	0.033	9
Dhemaji	1675	244	0.029	9	1265	184	0.059	7	0.042	8
Dibrugarh	13286	1001	0.162	1	5399	407	0.147	2	0.154	3
Golaghat	4466	419	0.060	5	2775	260	0.089	5	0.074	6
Jorhat	8391	907	0.146	2	4532	490	0.180	1	0.163	2
Lakhimpur	3217	309	0.040	6	2528	243	0.082	6	0.061	7
Majuli	326	195	0.020	10	208	124	0.035	9	0.027	10
Sivasagar	5360	694	0.108	3	2974	385	0.138	3	0.105	4
Tinsukia	8273	623	0.096	4	4009	302	0.106	4	0.101	5

Source: Authors own computation

Biswanath (0.212) district ranks highest in terms of penetration index and Majuli ranks lowest (0.027). In terms of deposit account per 1lakh population Dibrugarh district ranks highest with 0.162 index value, while with a value of 0.020Majuli ranks lowest. Jorhat (0.180) ranks the top position in terms of credit account per 1 lakh population while Charaideo (0.031) ranks at the bottom.

Usage Dimension Index:

Per capita credit (PCC), per capita deposit (PCD) and C-D ratio is used to calculate the usage index. Table 4shows district wise index values and its ranks:

Table 4: District wise Usage Dimension Index

Districts	PCD (Rs.)			PCC (Rs.)			C-D Ratio			Usage Index (U_i)	
	PCD	Index	Rank	PCC	Index	Rank	C-D Ratio	Index	Rank	U_i	Rank
Biswanath	32145	0.044	6	17660	0.066	7	59	0.400	7	0.170	9
Charaideo	30453	0.041	8	10542	0.036	10	42	0.138	10	0.072	10
Dhemaji	17498	0.019	10	17498	0.066	7	85	0.800	1	0.295	2
Dibrugarh	100420	0.160	1	39845	0.162	3	47	0.215	9	0.179	8
Golaghat	41749	0.060	5	23913	0.093	5	66	0.507	3	0.220	5
Jorhat	88116	0.139	2	44885	0.184	1	60	0.415	6	0.246	4
Lakhimpur	31676	0.043	7	23402	0.091	6	84	0.784	2	0.306	1
Majuli	29658	0.040	9	14661	0.053	9	65	0.492	4	0.195	6
Sivasagar	75758	0.118	3	40816	0.166	2	63	0.461	5	0.248	3
Tinsukia	62899	0.096	4	30869	0.123	4	54	0.323	8	0.180	7

Source: Author's own computation

From the table 4 it is clear that Lakhimpur district ranks number 1 (0.306) in terms of usage index followed by Dhemaji (0.295) and Sivasagar (0.248). In terms of per capita deposit Dibrugarh district ranks at the top (0.160) while it ranks in the 3rd position (0.162) in terms of per capita credit and 9th position (0.215) in credit-deposit ratio. Jorhat ranks in the 1st position in per capita credit and Dhemaji in credit-deposit ratio. Charaideo district ranks lowest in both per capita credit (0.036) and credit- deposit ratio (0.138).

Financial Inclusion Index (IFI)

IFI values of all the districts of Upper Assam have been computed using data on three dimensions: banking availability, penetration and usage of financial services, this is shown with the table 5 below.

Table 5: District wise Financial Inclusion Index

Districts	Availability Index		Penetration Index		Usage Index		FII	
	A_i	Rank	P_i	Rank	U_i	Rank	FII Value	Rank
Biswanath	0.197	6	0.212	1	0.170	9	0.194	4
Charaideo	0.124	9	0.033	9	0.072	10	0.076	10
Dhemaji	0.116	10	0.042	8	0.295	2	0.145	6
Dibrugarh	0.623	1	0.154	3	0.179	8	0.253	2
Golaghat	0.220	5	0.074	6	0.220	5	0.169	8
Jorhat	0.345	2	0.163	2	0.246	4	0.435	1
Lakhimpur	0.170	7	0.061	7	0.306	1	0.174	7
Majuli	0.149	8	0.027	10	0.195	6	0.116	9
Sivasagar	0.333	3	0.105	4	0.248	3	0.224	3
Tinsukia	0.262	4	0.101	5	0.180	7	0.179	5

Source: Author's Own Computation

Table 6: Distributions of Districts according to the value of Financial Inclusion Index (FII)

Index Value	Category	FII of Districts
$0.8 \leq FII \leq 1$	Very High Level Financial Inclusion	-
$0.6 \leq FII \leq 0.8$	High Level Financial Inclusion	-
$0.4 \leq FII \leq 0.6$	Medium Level Financial Inclusion	Jorhat
$0.2 \leq FII \leq 0.4$	Low Level Financial Inclusion	Dibrugarh, Sivsagar
$0 \leq FII \leq 0.2$	Very Low LevelFinancial Inclusion	Biswanath, Tinsukia, Lakhimpur, Golaghat,Dhemaji, Majuli, Charaideo

Table 6 reveals that among all the districts of Upper Assam Jorhat holds highest FII value 0.435 and falls under medium financial Inclusion category. Dibrugarh &Sivasagar falls

under the low category with FII values of 0.253 and 0.224. All other remaining districts of Upper Assam, Biswanath (0.194), Tinsukia (0.179), Lakimpur (0.174), Golaghat (0.169), Dhemaji (0.145), Majuli (0.116)&Charaideo (0.076) falls under the very low financial inclusion category. Charadieo district which ranks lowest among all the districts in FII index is performing very low in all the three dimensions. However, it is clear from table that all the low performing districts in FII is not performing low in all the three dimensions. In terms of availability Dibrugarh district ranks highest while in terms of usage the district ranks 8th position. Similarly in terms of penetration Biswanath ranks highest but the districts ranks 9th and 6th position in usage and availability index. In terms of usage of financial services Lakhimpur district ranks highest while the districts ranks only in 7th position in both availability and penetration index.

Conclusion

Financial Inclusion Index has been widely accepted touchstone to measure performance of inclusion as it allows comparison among countries, states and districts. It helps in establishing the relative rankings and recognizes the factors responsible for lower inclusion. In Assam although continuous measures has been adopted to accelerate the financial inclusion coverage but yet level of inclusion varies among districts and regions.Findings of the study shows prevalence of wide spread disparities among the districts considered in terms different dimensions of financial inclusion. More importantly results of the study reveal almost all districts considered under study come under very low financial inclusion category. District and regional level financial policies will help inovercoming the constraints of financial inclusion and achieve full inclusion in recent years.

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